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EXAMINER	
DOUYETTE, KENNETH J	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/595,470	BURCHARDT, TRYGVE	
	Examiner	Art Unit	
	KENNETH DOUYETTE	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 May 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *38-85* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *38-85* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Claims 38-85 are pending in the application.

2. Previous grounds of rejection under 35 USC 112 have been removed as a result of the amendment to the claims dated 5/6/2011.

3. New grounds of rejection have been introduced.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 61-65, 72, 75-76 and 78-81 are rejected under 35 U.S.C. 102(b) as being anticipated by Klein et al. (US 2003/0013015).

Regarding claim 61, Klein et al. discloses in Fig 1, an electrode ([0042]) for use in an electrochemical cell (ref 1) comprising:

- a first sheet (ref 2) comprising a hydrogen storage material ([0043]); and
- a second sheet (ref 7) separate (Fig 1) from the first sheet (ref 2), the second sheet (ref 7) comprising a high energy density metal ([0049]) that is configured to act as a hydrogen source (refs 2 and 7 are in contact with one another, Fig 1) for the hydrogen storage material ([0043]) on reaction with electrolyte ([0047]) in the

cell (ref 1). Additionally, if a prior art structure is capable of performing the intended use as recited in the preamble, then it meets the claim. See, e.g., *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997).

Regarding claim 62, Klein et al. discloses all of the claim limitations as set forth above and also discloses the high energy density metal comprises Al and such alloys ([0047]).

Regarding claim 63, Klein et al. discloses all of the claim limitations as set forth above but does not disclose the high energy density metal is mixed with PTFE and/or graphite.

Dansui et al. discloses a battery comprising an electrode formed of a high energy density metal (C11/L24) with a carbonaceous material (C11/L30) and PTFE mixed in (C11/L30-31). This configuration enhances adhering of the material containing the high energy density metal to a current collector and enhances the capacity of the battery (C11/L32-40).

Dansui et al. and Klein et al. are analogous since both deal in the same field of endeavor, namely, batteries.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the carbonaceous material and PTFE mixed with a high energy density metal disclosed by Dansui et al. into the second sheet of Klein et al. to enhance the structure of the electrode and enhance overall battery capacity and performance.

Regarding claim 64, Klein et al. discloses all of the claim limitations as set forth above and also discloses the hydrogen storage material is an alloy consisting of rare earth/mich alloys ([0043]).

Regarding claim 65, Klein et al. discloses all of the claim limitations as set forth above and also discloses the first sheet (ref 2) comprises PTFE mixed ([0066]) with the hydrogen storage material ([0043]).

Regarding claim 72, Klein et al. discloses all of the claim limitations as set forth above and also discloses a current collector ([0045]) pressed into the first sheet (ref 2).

Regarding claim 75, Klein et al. discloses all of the claim limitations as set forth above and also discloses the electrochemical cell (ref 1) is a metal hydride cell ([0043]).

Regarding claim 76, Klein et al. discloses all of the claim limitations as set forth above and also discloses the electrochemical cell (ref 1) is a nickel ([0044]) metal hydride cell ([0043]).

Regarding claim 78, Klein et al. discloses all of the claim limitations as set forth above and also discloses the electrode ([0042]) is a negative electrode ([0042]).

Regarding claims 79, 80 and 81, Klein et al. discloses all of the claim limitations as set forth above and also discloses the high energy density metal is configured to provide self-charging (refs 2 and 7 contact one another, Fig 1, [0047]-[0048]) for the electrochemical cell (ref 1) and provide increase capacity (refs 2 and 7 contact one another, Fig 1, [0048]-[0049]) for the electrochemical cell (ref 1) and to provide increased peak power (refs 2 and 7 contact one another, Fig 1, [0047]-[0048]) for the electrochemical cell (Fig 1). Additionally, if a prior art structure is capable of performing the intended use as recited, then it meets the claim. See, e.g., *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997).

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 38-44, 55, 60, 82-83 and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klein et al. (US 2003/0013015) in view of Dansui et al. (US 6,033,805).

Regarding claim 38, Klein et al. discloses in Fig 1, an electrode ([0042]) for use in an electrochemical cell (ref 1) comprising:

- a first sheet (ref 2) comprising a hydrogen storage material ([0043]); and
- a second sheet (ref 7) separate (Fig 1) from the first sheet (ref 2), the second sheet (ref 7) comprising a high energy density metal ([0049]) that is configured to act as a hydrogen source (refs 2 and 7 are in contact with one another, Fig 1) for

the hydrogen storage material ([0043]) on reaction with electrolyte ([0047]) in the cell (ref 1). Additionally, if a prior art structure is capable of performing the intended use as recited in the preamble, then it meets the claim. See, e.g., *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997).

Klein et al. does not disclose the high energy density metal is mixed with PTFE or graphite.

Dansui et al. discloses a battery comprising an electrode formed of a high energy density metal (C11/L24) with PTFE mixed in (C11/L30-31). This configuration enhances adhering of the material containing the high energy density metal to a current collector and enhances the capacity of the battery (C11/L32-40).

Dansui et al. and Klein et al. are analogous since both deal in the same field of endeavor, namely, batteries.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the PTFE mixed with a high energy density metal disclosed by Dansui et al. into the second sheet of Klein et al. to enhance the structure of the electrode and enhance overall battery capacity and performance.

Regarding claim 39, modified Klein et al. discloses all of the claim limitations as set forth above and also discloses the high energy density metal comprises Al and such alloys ([0047]).

Regarding claims 40 and 41, Klein et al. discloses all of the claim limitations as set forth above but does not disclose the high energy density metal is mixed with PTFE and/or graphite.

Dansui et al. discloses a battery comprising an electrode formed of a high energy density metal (C11/L24) with a carbonaceous material (C11/L30) and PTFE mixed in (C11/L30-31). This configuration enhances adhering of the material containing the high energy density metal to a current collector and enhances the capacity of the battery (C11/L32-40).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the carbonaceous material and PTFE mixed with a high energy density metal disclosed by Dansui et al. into the second sheet of Klein et al. to enhance the structure of the electrode and enhance overall battery capacity and performance.

Regarding claim 42, modified Klein et al. discloses all of the claim limitations as set forth above and also discloses the hydrogen storage material is an alloy consisting of rare earth/mich alloys ([0043]).

Regarding claim 43, modified Klein et al. discloses all of the claim limitations as set forth above and also discloses the first sheet (ref 2) comprises PTFE mixed ([0066]) with the hydrogen storage material ([0043]).

Regarding claim 44, modified Klein et al. discloses all of the claim limitations as set forth above and also discloses the first sheet (ref 2) comprises carbon mixed ([0043]) with the hydrogen storage material ([0043]).

Regarding claim 55, modified Klein et al. discloses all of the claim limitations as set forth above and also discloses a current collector ([0045]) pressed into the first sheet (ref 2).

Regarding claim 60, modified Klein et al. discloses all of the claim limitations as set forth above and also discloses the high energy density metal ([0049]) is configured to prevent corrosion (refs 2 and 7 are in contact with one another, Fig 1) of the electrode ([0042]). Additionally, if a prior art structure is capable of performing the intended use as recited, then it meets the claim. See, e.g., *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997).

Regarding claims 82-83, Klein et al. discloses in Fig 1, a method of producing an electrode ([0042]) for an electrochemical cell (ref 1), the electrode ([0042]) comprising a hydrogen storage alloy ([0043]) and a high energy density metal ([0049]), the method comprising:

- forming a first sheet (ref 7) of a high energy density metal ([0047]);
- forming a second sheet (ref 2) comprising a hydrogen storage allow ([0043]); and

- pressing ([0048]-[0049]) the first (ref 7) and second (ref 2) sheets together to form the electrode ([0042]).

Klein et al. does not disclose sintering with a binder (PTFE) the first sheet.

Dansui et al. discloses a battery comprising an electrode formed of a high energy density metal (C11/L24) with PTFE mixed in (C11/L30-31). This configuration enhances adhering of the material containing the high energy density metal to a current collector and enhances the capacity of the battery (C11/L32-40).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the PTFE mixed with a high energy density metal disclosed by Dansui et al. into the second sheet of Klein et al. to enhance the structure of the electrode and enhance overall battery capacity and performance.

Regarding claim 85, modified Klein et al. discloses all of the claim limitations as set forth above and also discloses pressing a current collector ([0045]) into the second sheet (ref 2).

8. Claims 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klein et al. (US 2003/0013015) in view of Dansui et al. (US 6,033,805) as applied to claim 38 above and further in view of Bando et al. (US 5,965,295).

Regarding claims 45, 46, Klein et al. discloses all of the claim limitations as set forth above and also discloses the hydrogen storage material is a metal hydride ([0043])

selected from the group consisting of AB5 ([0043]), AB2 ([0043]), but does not explicitly disclose A is a Group IIb metal, transition metla, rare-earth metal, or metal of the actinide series, and B is a metal of the transition series, nor that the AB5 has hexagonal or orthorhombic structure and is LaNi5 or MnNi5 where Mm is a combination of La and other rare-earth elements.

Bando et al. discloses an electrode (ref 4) comprises hydrogen storage material (C7/L32-35) that is $LaNi_5$ or $NmNi_5$ type (C7/L32-33). This configuration enhances over-discharge (C2/L31-32), capacity (C2/L25), charge/discharge cycles (C2/L25-27), and enhanced tensile strength (C2/L40-41).

Bando and Klein are analogous since both deal in the same field of endeavor, namely, batteries.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the $LaNi_5$ or $NmNi_5$ type of Bando et al. into the material of Klein to enhance over-discharge, capacity, cycling and tensile strength of the electrode incorporating the material.

9. Claim 66 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klein et al. (US 2003/0013015) as applied to claim 61 above and further in view of Bando et al. (US 5,965,295).

Regarding claim 66, Klein et al. discloses all of the claim limitations as set forth above and also discloses the hydrogen storage material is a metal hydride ([0043]) selected from the group consisting of AB5 ([0043]), AB2 ([0043]), but does not explicitly

disclose A is a Group IIb metal, transition metla, rare-earth metal, or metal of the actinide series, and B is a metal of the transition series, nor that the AB5 has hexagonal or orthorhombic structure and is LaNi5 or MnNi5 where Mm is a combination of La and other rare-earth elements.

Bando et al. discloses an electrode (ref 4) comprises hydrogen storage material (C7/L32-35) that is $LaNi_5$ or $NmNi_5$ type (C7/L32-33). This configuration enhances over-discharge (C2/L31-32), capacity (C2/L25), charge/discharge cycles (C2/L25-27), and enhanced tensile strength (C2/L40-41).

Bando and Klein are analogous since both deal in the same field of endeavor, namely, batteries.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the $LaNi_5$ or $NmNi_5$ type of Bando et al. into the material of Klein to enhance over-discharge, capacity, cycling and tensile strength of the electrode incorporating the material.

10. Claims 47-54 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klein et al. (US 2003/0013015) in view of Dansui et al. (US 6,033,805) as applied to claim 38 above and further in view of Young et al. (US 6,461,766).

Regarding claims 47-48, Klein et al. discloses all of the claim limitations as set forth above but does not disclose a hydrogen electrocatalyst.

Young et al. discloses a battery (C1/L26) comprising an electrode consisting of a hydrogen storage material (C9/L67-C10/L1) and a powdered (C10/L18) passivating

material (C9/L67) added to improve activation of the hydrogen storage material (C10/L1-4), the passivating material selected from the group consisting of Ni, Fe, Cr or an alloy thereof (C10/L20-21) and layered (C10/L22) in the electrode active material.

Young et al. and Klein et al. are analogous since both deal in the same field of endeavor, namely, batteries.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the passivating/electrocatalyst material as disclosed by Young et al. into the composition of Klein et al. to enhance activation of the hydrogen storage material, enhancing overall battery performance.

Regarding claim 49, Klein et al. discloses all of the claim limitations as set forth above but does not disclose a hydrogen electrocatalyst deposited thereon.

Young et al. discloses a battery (C1/L26) comprising an electrode consisting of a hydrogen storage material (C9/L67-C10/L1) and a powdered (C10/L18) passivating material (C9/L67) added to improve activation of the hydrogen storage material (C10/L1-4), the passivating material layered (C10/L22) in the electrode active material.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the passivating/electrocatalyst material as disclosed by Young et al. as deposited or layered on the material of Klein et al. to enhance activation of the hydrogen storage material, enhancing overall battery performance.

Regarding claim 50, Klein et al. discloses all of the claim limitations as set forth above but does not disclose the high surface area support material is graphite.

Bando et al. discloses in Figs 1-2, an electrode (ref 4) in an electrochemical cell (Fig 1), said electrode (ref 4) comprising a hydrogen storage material (C7/L32-35) and high energy density metal (C7/L37), wherein the hydrogen storage material (C7/L32-35) and the high energy density metal (C7/L37) are in contact with each other such that the high energy density metal (C7/L37) is capable of acting as a hydrogen source for the hydrogen storage material (C7/L32-35) on reaction with electrolyte (C5/L66-67) and the high energy density metal (C7/L37) is capable of acting as anode (ref 4, C7/L11-37) material for the cell (Fig 1). Additionally, graphite (C7/L46-47) is mixed in the composition. This configuration enhances over-discharge (C2/L31-32), capacity (C2/L25), charge/discharge cycles (C2/L25-27), and enhanced tensile strength (C2/L40-41).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the graphite of Bando et al. into the material of Klein to enhance over-discharge, capacity, cycling and tensile strength of the electrode incorporating the material.

Regarding claim 51-52, Klein et al. discloses all of the claim limitations as set forth above and also discloses two distinct sheets (ref 2, 7), but does not disclose a hydrogen electrocatalyst disposed in either sheet.

Young et al. discloses a battery (C1/L26) comprising an electrode consisting of a hydrogen storage material (C9/L67-C10/L1) and a powdered (C10/L18) passivating material (C9/L67) added to improve activation of the hydrogen storage material (C10/L1-4) which may include Mg (C7/L21), the passivating material selected from the group consisting of Ni, Fe, Cr or an alloy thereof (C10/L20-21) and layered (C10/L22) in the electrode active material.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the passivating/electrocatalyst material as disclosed by Young et al. into the composition of Klein et al. to enhance activation of the hydrogen storage material, enhancing overall battery performance. Additionally, since Young et al. discloses the passivating material disclosed with both the hydrogen storage material and the Mg, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the passivating material in either of the layers of Klein et al., since the layered structure of Young et al. is a design known in the art. Further, since the instant specification is silent to unexpected result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange the passivating material of Young et al. in either layer of Klein, because selecting one of known designs for a layered electrode would have been considered obvious to one of ordinary skill in the art at the time of the invention and because said electrode containing passivating material in either layer equally well as the one disclosed by modified Young et al. Further still, since it has been held that rearranging parts of an invention involves only routine skill in the art while the device having the claimed

dimensions would not perform differently than the prior art device, *In re Japikse*, 86 USPQ 70 and since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art, *In re Einstein*, 8 USPQ 167.

Regarding claim 53, Klein et al. discloses all of the claim limitations as set forth above and also discloses layers (refs 2 and 7), as well as ref 7 comprising "several layers" ([0049]), but not an additional, separate layer that contains the hydrogen electrocatalyst.

Young et al. discloses the passivating material (C9/L67) adheres or covers a part of the surface (C10/L10-11) of the hydrogen storage material particles (C10/L1-4). Covering "a part" of the surface of the particles results in which, for example, the top part of the particles are covered, thus essentially forming a layer entirely comprised of hydrogen electrocatalyst material. This improve activation of the hydrogen storage material (C10/L1-4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the passivating/electrocatalyst material as disclosed by Young et al. into the active material composition of Bando et al. to enhance activation of the hydrogen storage material, enhancing overall battery performance. Additionally, partial coating of hydrogen storage material particles forming a surface coating essentially results in a design choice. Since the instant specification is silent to unexpected result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange a hydrogen electrocatalyst as a separate layer unto itself

as taught by Young et al. into the structure of Klein et al., because selecting one of known designs for a layered electrode structure would have been considered obvious to one of ordinary skill in the art at the time of the invention and because said layered electrode defining a separate and distinct layer containing hydrogen electrocatalyst would operate equally well as the one disclosed by Klein et al.

Regarding claim 54, modified Klein et al. discloses all of the claim limitations as set forth above and also discloses current collectors ([0045]), but does not explicitly disclose the current collectors are mesh.

Bando et al. discloses a mesh current collector (Fig 2) is pressed into the active materials (C12/L8-13). This configuration enhances active material adhesion to current collectors, enhancing tensile strength (C2/L40-41) of the structure.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the current collector of Klein et al. as mesh as disclosed by Bando et al. to enhance adhesion of active materials to the current collector, enhancing tensile strength of the structure.

Regarding claim 84, modified Klein et al. discloses all of the claim limitations as set forth above and also discloses forming a third sheet ("several layers") ([0049]), combined together ([0049]) with the layers (refs 2, 7), but does not disclose an electrocatalyst added to a third sheet.

Young et al. discloses a battery (C1/L26) comprising an electrode consisting of a hydrogen storage material (C9/L67-C10/L1) and a powdered (C10/L18) passivating material (C9/L67) added to improve activation of the hydrogen storage material (C10/L1-4), the passivating material selected from the group consisting of Ni, Fe, Cr or an alloy thereof (C10/L20-21) and layered (C10/L22) in the electrode active material.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the passivating/electrocatalyst material as disclosed by Young et al. into the composition of Klein et al. to enhance activation of the hydrogen storage material, enhancing overall battery performance.

11. Claims 67-71 and 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klein et al. (US 2003/0013015) as applied to claim 61 above and further in view of Young et al. (US 6,461,766).

Regarding claim 67, Klein et al. discloses all of the claim limitations as set forth above but does not disclose a hydrogen electrocatalyst.

Young et al. discloses a battery (C1/L26) comprising an electrode consisting of a hydrogen storage material (C9/L67-C10/L1) and a powdered (C10/L18) passivating material (C9/L67) added to improve activation of the hydrogen storage material (C10/L1-4), the passivating material selected from the group consisting of Ni, Fe, Cr or an alloy thereof (C10/L20-21) and layered (C10/L22) in the electrode active material.

Young et al. and Klein et al. are analogous since both deal in the same field of endeavor, namely, batteries.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the passivating/electrocatalyst material as disclosed by Young et al. into the composition of Klein et al. to enhance activation of the hydrogen storage material, enhancing overall battery performance.

Regarding claims 68-69, Klein et al. discloses all of the claim limitations as set forth above and also discloses two distinct sheets (ref 2, 7), but does not disclose a hydrogen electrocatalyst disposed in either sheet.

Young et al. discloses a battery (C1/L26) comprising an electrode consisting of a hydrogen storage material (C9/L67-C10/L1) and a powdered (C10/L18) passivating material (C9/L67) added to improve activation of the hydrogen storage material (C10/L1-4) which may include Mg (C7/L21), the passivating material selected from the group consisting of Ni, Fe, Cr or an alloy thereof (C10/L20-21) and layered (C10/L22) in the electrode active material.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the passivating/electrocatalyst material as disclosed by Young et al. into the composition of Klein et al. to enhance activation of the hydrogen storage material, enhancing overall battery performance. Additionally, since Young et al. discloses the passivating material disclosed with both the hydrogen storage material and the Mg, it would have been obvious to one of ordinary skill in the art at the time of

the invention to incorporate the passivating material in either of the layers of Klein et al., since the layered structure of Young et al. is a design known in the art. Further, since the instant specification is silent to unexpected result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange the passivating material of Young et al. in either layer of Klein, because selecting one of known designs for a layered electrode would have been considered obvious to one of ordinary skill in the art at the time of the invention and because said electrode containing passivating material in either layer equally well as the one disclosed by modified Young et al. Further still, since it has been held that rearranging parts of an invention involves only routine skill in the art while the device having the claimed dimensions would not perform differently than the prior art device, *In re Japikse*, 86 USPQ 70 and since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art, *In re Einstein*, 8 USPQ 167.

Regarding claim 70, Klein et al. discloses all of the claim limitations as set forth above and also discloses layers (refs 2 and 7), as well as ref 7 comprising "several layers" ([0049]), but not an additional, separate layer that contains the hydrogen electrocatalyst.

Young et al. discloses the passivating material (C9/L67) adheres or covers a part of the surface (C10/L10-11) of the hydrogen storage material particles (C10/L1-4). Covering "a part" of the surface of the particles results in which, for example, the top part of the particles are covered, thus essentially forming a layer entirely comprised of

hydrogen electrocatalyst material. This improve activation of the hydrogen storage material (C10/L1-4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the passivating/electrocatalyst material as disclosed by Young et al. into the active material composition of Bando et al. to enhance activation of the hydrogen storage material, enhancing overall battery performance. Additionally, partial coating of hydrogen storage material particles forming a surface coating essentially results in a design choice. Since the instant specification is silent to unexpected result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange a hydrogen electrocatalyst as a separate layer unto itself as taught by Young et al. into the structure of Klein et al., because selecting one of known designs for a layered electrode structure would have been considered obvious to one of ordinary skill in the art at the time of the invention and because said layered electrode defining a separate and distinct layer containing hydrogen electrocatalyst would operate equally well as the one disclosed by Klein et al.

Regarding claim 71, Klein et al. discloses all of the claim limitations as set forth above and also discloses current collectors ([0045]), but does not explicitly disclose the current collectors are mesh.

Bando et al. discloses a mesh current collector (Fig 2) is pressed into the active materials (C12/L8-13). This configuration enhances active material adhesion to current collectors, enhancing tensile strength (C2/L40-41) of the structure.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the current collector of Klein et al. as mesh as disclosed by Bando et al. to enhance adhesion of active materials to the current collector, enhancing tensile strength of the structure.

Regarding claim 77, Klein et al. discloses all of the claim limitations as set forth above but does not explicitly disclose the electrochemical cell is a fuel cell.

Young discloses a fuel cell (C1/L26-27) containing electrodes containing hydrogen storage materials. Since the instant specification is silent to unexpected result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange an electrochemical cell of Smith to be a fuel cell, as taught by Young et al., because selecting one of known designs for an electrochemical cell would have been considered obvious to one of ordinary skill in the art at the time of the invention and because said electrochemical cell comprising a fuel cell would operate equally well as the one disclosed by Klein et al.

12. Claims 57-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klein et al. (US 2003/0013015) in view of Dansui et al. (US 6,033,805) as applied to claim 38 above and further in view of Hampden-Smith et al. (US 2003/0054218).

Regarding claim 57, Klein et al. disclose all of the claim limitations as set forth above but does not disclose a separator disposed between layers 2 and 7.

Hampden-Smith discloses a battery ([0318]) containing a Zn metal layer ([0318]) and a metal hydride layer ([0318]) separated by a separator ([0320]). Since the instant specification is silent to unexpected result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange a layered electrochemical structure of Klein et al. to have a separator between metal and metal hydride layers, as taught by Hampden-Smith et al., because selecting one of known designs for an electrochemical cell would have been considered obvious to one of ordinary skill in the art at the time of the invention and because said electrochemical cell defining a metal layer and metal hydride layer separated by a separator would operate equally well as the one disclosed by Klein et al.

Regarding claim 58, Klein et al. discloses all of the claim limitations as set forth above and also discloses an energy carrier layer comprising one sheet (ref 7); a hydrogen absorption layer comprising the other sheet (ref 2); and a mechanical support (ref 4). While reference does not disclose said first and second sheets containing an energy carrier layer and hydrogen absorption layer respectively, it would have been obvious to one having ordinary skill in the art at the time the invention was made to reverse the configuration of said sheets, by incorporating the energy material into the first sheet and the hydrogen absorption material into the second, since it has been held that rearranging parts of an invention involves only routine skill in the art while the device having the claimed dimensions would not perform differently than the prior art device, *In re Japikse*, 86 USPQ 70 and since it has been held that a mere reversal of

the essential working parts of a device involves only routine skill in the art, *In re Einstein*, 8 USPQ 167.

Klein et al. does not disclose a catalyst layer.

Hampden-Smith et. al discloses a battery ([0320]) that contains a catalyst layer ([0320]) to catalyze an electrochemical reaction within the battery to produce power ([0012]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the catalyst layer of Hampden-Smith et al. into the structure of Klein et al. to catalyze the electrochemical reaction to enhance the power performance of the electrochemical cell.

Regarding claim 59, Klein et al. disclose all of the claim limitations as set forth above but does not disclose the high energy density material is configured to act as an anode. Hampden-Smith discloses a battery ([0318]) containing a Zn metal anode ([0356]). Since the instant specification is silent to unexpected result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange a metal layer of Klein et al. to have act as an anode, as taught by Hampden-Smith et al., because selecting one of known designs for an electrochemical cell would have been considered obvious to one of ordinary skill in the art at the time of the invention and because said electrochemical cell defining a metal layer as an anode would operate equally well as the one disclosed by Klein et al.

13. Claim 74 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klein et al. (US 2003/0013015) as applied to claim 61 above and further in view of Hampden-Smith et al. (US 2003/0054218).

Regarding claim 74, Klein et al. disclose all of the claim limitations as set forth above but does not disclose a separator disposed between layers 2 and 7.

Hampden-Smith discloses a battery ([0318]) containing a Zn metal layer ([0318]) and a metal hydride layer ([0318]) separated by a separator ([0320]). Since the instant specification is silent to unexpected result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange a layered electrochemical structure of Klein et al. to have a separator between metal and metal hydride layers, as taught by Hampden-Smith et al., because selecting one of known designs for an electrochemical cell would have been considered obvious to one of ordinary skill in the art at the time of the invention and because said electrochemical cell defining a metal layer and metal hydride layer separated by a separator would operate equally well as the one disclosed by Klein et al.

14. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klein et al. (US 2003/0013015) in view of Dansui et al. (US 6,033,805) as applied to claim 38 above and further in view of Bauerline (US 2002/0042000).

Regarding claims 56 and 73, Klein et al. discloses all of the claim limitations as set forth above but does not disclose the first and second sheets are coupled together by a resistor.

Bauerline discloses a Ni/metal hydride cell (Abstract) that is coupled to a resistor ([0027]) to reduce/stop charging and allow for charge storage ([0027]).

Bauerline and Klein et al. are analogous since both deal in the same field of endeavor, namely, batteries.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the resistor of Bauerline into the structure of Klein et al. to reduce/stop charging and allow for a definite charge quantity to be stored.

15. Claim 73 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klein et al. (US 2003/0013015) as applied to claim 61 above and further in view of Bauerline (US 2002/0042000).

Regarding claims 56 and 73, Klein et al. discloses all of the claim limitations as set forth above but does not disclose the first and second sheets are coupled together by a resistor.

Bauerline discloses a Ni/metal hydride cell (Abstract) that is coupled to a resistor ([0027]) to reduce/stop charging and allow for charge storage ([0027]).

Bauerline and Klein et al. are analogous since both deal in the same field of endeavor, namely, batteries.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the resistor of Bauerline into the structure of Klein et al. to reduce/stop charging and allow for a definite charge quantity to be stored.

Response to Arguments

16. Applicant's arguments filed 5/6/2011 have been fully considered but they are not persuasive.

Applicant argues Klein discloses a structure wherein the metal layer is laminated, and thus sealed off from any electrolyte, and thus is not capable of interacting with the electrolyte as set forth in the instant claims. However, Klein discloses the electrodes (refs 2, 3) may be pre-wet with electrolyte when assembling ([0056]). Thus, ref 2 is soaked with electrolyte and is contacted by the metal comprising layer of ref 7 allowing an interaction to occur.

Applicant's further arguments with respect to claims 38-85 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENNETH DOUYETTE whose telephone number is (571)270-1212. The examiner can normally be reached on Monday - Thursday 6am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571) 272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KENNETH DOUYETTE/
Examiner, Art Unit 1725

/Jonathan Crepeau/
Primary Examiner, Art Unit 1725